



CERONIX

15, 17, 19, 20, 22 INCH LCD MONITOR SPECIFICATION and OPERATION MANUAL

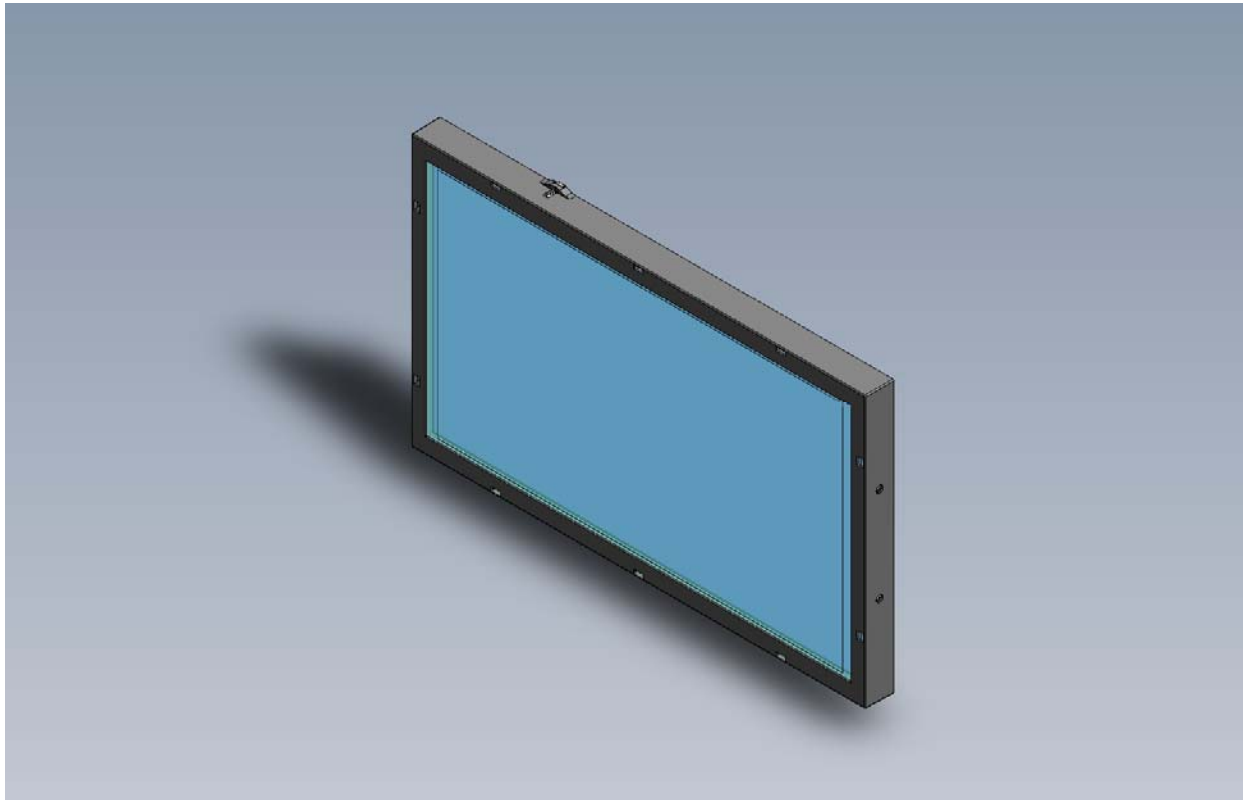
MODELS

15/17/19/20/2205-LCD

15/17/19/20/2207-LCD

15/17/19/20/2208-LCD

15/17/19/20/2209-LCD



13350 NEW AIRPORT ROAD • AUBURN, CA 95602 • TEL 530.886.6400 • FAX 530.888.1065
WWW.CERONIX.COM



CERONIX

4 YEAR LIMITED WARRANTY

This product is warranted by CERONIX to be free of defects in material and workmanship for a period of two years from the date of purchase. All parts and labor are free of charge during the warranty period. This warranty does not cover mechanical breakage due to physical abuse or LCD panel image retention. It is the customers responsibility for shipping the defective unit to and from CERONIX or one of the authorized service centers for repair.

Please call Ceronix to obtain RMA number to include with the unit and ship to:

CERONIX Inc.
13350 New Airport Road
Auburn, CA 95602-7419
Phone: 530-886-6400
FAX: 530-888-1065
WEB: www.ceronix.com

CERONIX shall not be liable for and consequential damages, including without limitation damages resulting from loss of use.

CERONIX will repair the XX0X-LCD monitors after the 4 year warranty for a minimal charge, plus shipping to and from CERONIX.



IMPORTANT SAFETY INSTRUCTIONS

This product is designed and manufactured to operate within defined design limits, and misuse may result in electric shock or fire. To prevent the product from being damaged, the following rules should be observed for the installation, use and maintenance of the product. Read the following safety instructions before operating the display. Keep these instructions in a safe place for future reference.

Operation and Installation

- To reduce the risk of electric shock or component damage, switch off the power before connecting other components to the display.
- Unplug the power cord before cleaning the display. A damp cloth is sufficient for cleaning the display. Do not use a liquid or a spray cleaner for cleaning the product. Do not use abrasive cleaners.
- The display should be operated only from the type of power source indicated on the label.
- The display can be equipped with various connectors that allow for AC or DC power input. Make sure to use the appropriate mating connector and voltage when connecting to display.
- When connected to a power source, power is always into your display. To totally disconnect the power, unplug the power cord.
- When installing display, always use mounting points provided on the display itself. Do not drill into or modify display housing.

Servicing

- For continued safety, do not attempt to modify circuit boards within the display.
- Disconnect AC or DC power before servicing.
- When the chassis is operating, power supply heat sinks can be potential shock hazards.
- After servicing, always check to see that components, wiring, screws have been properly installed.

Product Safety Note

- Some components used in these display units have special characteristics important to safety. These components can be identified by the following symbol in the parts list. ⚠ If it is necessary to replace these parts be sure to use the parts specified in the parts list.

INSTRUCTIONS DE SÉCURITÉ IMPORTANTES

Ce produit est conçu et fabriqué pour opérer dans les limites de design définies et le mauvais usage peut s'ensuivre dans le décharge électrique ou le feu. Pour empêcher le produit d'être nui, les règles suivantes devraient être observées pour l'installation, utiliser et la maintenance du produit. Lisez les instructions de sécurité suivantes avant le fait de faire marcher l'étalage. Gardez ces instructions dans un endroit sûr pour la référence future.

Opération et Installation

- Pour réduire le risque de décharge électrique ou de dommage composant, éteignez le pouvoir avant le fait de raccorder d'autres composantes à l'étalage.
- Débranchent la corde de pouvoir avant le fait de nettoyer l'étalage. Un tissu humide est suffisant pour nettoyer l'étalage. N'utilisez pas de liquide ou un appareil de nettoyage de spray pour nettoyer le produit. N'utilisez pas d'appareils de nettoyage abrasifs.
- L'étalage devrait être fait marcher seulement du type de source de pouvoir indiquée sur l'étiquette.
- L'étalage peut être équipé avec les connecteurs différents qui tiennent compte la puissance consommée de courant continu ou du courant alternatif. Assurez-vous pour utiliser le connecteur s'accouplant approprié et le voltage en raccordant pour afficher.
- Quand raccordé à une source de pouvoir, le pouvoir est toujours dans votre étalage. Pour complètement débrancher le pouvoir, débranchez la corde de pouvoir.
- en installant l'étalage, utilisez toujours des points montants fournis sur l'étalage lui-même. Ne forez pas dans ou modifiez l'habitation d'étalage.

Entretien

- Pour la sécurité continuée, n'essayez pas de modifier des cartes de circuit dans l'étalage.
- Débranchent le courant alternatif ou le pouvoir de courant continu avant l'entretien.
- Quand les châssis opère, les évier de chaleur d'alimentation électrique peuvent être des hasards de choc potentiels.
- Après l'entretien, vérifiez toujours pour voir que les composantes, l'installation électrique, les vis ont été correctement installées.

Note de Sécurité de Produit

- Quelques composantes utilisées dans ces visualisateurs ont des caractéristiques spéciales importantes pour la sécurité. Ces composantes peuvent être identifiées par le symbole suivant dans la liste de parties. ⚠ S'il est nécessaire de remplacer ces parties sont sûr d'utiliser les parties spécifiées dans la liste de parties.



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4. General Description

This specification and operation manual defines the characteristics and performance of the Ceronix 15, 17, 19, 20, 22 Inch LCD Monitors. This product is capable of displaying resolutions from VGA to SXGA. The built in A/D controller is capable of displaying up to 16,777,216 colors based on its red, green, and blue analog video input. Video synchronization signals of applicable resolution modes can be automatically detected in the range of 15.5kHz to 80kHz horizontal and 56Hz to 75Hz vertical. Unless otherwise specified, the product shall meet the specifications described in this document.

5. General Features

Native Resolution: 15" (1024X768 Pixels), 17", 19" (1280X1024), 20" (1600X900), 22" (1680X1050)

Color: 16,777,216 (8 Bit Color)

Input:

1. 15-Pin H-Dsub Analog RGB (0.7Vp-p, 75ohm, H/V Sync, TTL)
Horizontal Frequency Range: 31.5kHz~80kHz
Vertical Frequency Range: 56~75Hz
2. 24-Pin DVI-D

Controls:

1. OSD navigated keypad with Menu, Up, Down, Select, and Power.
2. Optional Infra-red remote control.

OSD Menu:

Contrast Brightness, Color Adjust, H-Position, H-Size, V-Position, Language, Reset, Signal Source.

Mechanical Flexibility:

Monitor Chassis designed to fit into numerous applications with existing mounting studs or with adapter brackets.

Optional Touch Sensor allows for interactive display.

Infra-Red remote allows for easy adjustment.

All electrical components designed for long life and running in industrial and gaming applications



6. Electrical and Panel Specifications

Panel	TFT Active Matrix VA (Vertical Alignment) TFT Active Matrix TN (Twisted Nematic)
Viewable Size	15", 17", 19", 20", 22"
Native Resolution	15" 1024x768; 17", 19" 1280x1024; 20" 1600x900; 22" 1680x1050
Aspect Ratio	15" 4:3; 17", 19" 5:4; 20" 16:9, 22" 16:10
Pixel Size (mm)	0.297(15"), 0.264(17"), 0.294(19"), 0.2768(20"), 0.282(22")
Brightness (Typical)	250 cd/m ²
Contrast Ratio	500:1 –3000:1
Response Time (Sum of Tr, Tf in ms)	5-20
Colors Supported	16.7 Million
Viewing Angle	178° in Horizontal and Vertical Directions (VA) 170°H, 165°V (TN)
Interface	Analog & Digital
Input Connectors	RGB 15-Pin D-Sub, DVI-D
Signal Frequency	15.5-80KHz Horizontal, 56-75Hz Vertical
Power/Voltage (XX05-LCD)	25-35W, 90 - 264VAC, 50/60Hz
Voltage (XX07-LCD)	12Vdc, 24Vdc
Voltage (XX08-LCD)	24Vdc
Voltage (XX09-LCD)	5Vdc, 12Vdc, 24Vdc



7. Application Timing

RESOLUTION	VERTICAL FREQUENCY	HORIZONTAL FREQUENCY	PIXEL FREQUENCY
640 x 400	70 Hz	31.46 kHz	
720 x 400	70 Hz	31.46 kHz	
640 x 480	60 Hz	31.50 kHz	25.175 MHz
640 x 480	72 Hz	37.90 kHz	31.500 MHz
640 x 480	75 Hz	37.50 kHz	31.500 MHz
800 x 600	60 Hz	37.90 kHz	40.000 MHz
800 x 600	72 Hz	48.10 kHz	50.000 MHz
800 x 600	75 Hz	46.90 kHz	49.500 MHz
1024 x 768	60 Hz	48.40 kHz	65.000 MHz
1024 x 768	70 Hz	56.50 kHz	75.000 MHz
1024 x 768	75 Hz	60.00 kHz	78.750 MHz
1280 x 1024	60 Hz	64.00 kHz	108.000 MHz
1280 x 1024	75 Hz	80.00 kHz	135.000MHz

The XX0X-LCD series monitors support the video timings listed above. There are many different video cards and video signal formats in gaming and industrial applications. In general, the video signal of various VGA cards are compatible with VESA recommendations, but many legacy gaming machines are not. The Ceronix XX0X-LCD is designed under the assumption that every video signal is standardized, therefore some signals may not lock in perfectly during auto-signal detect. To avoid this compatibility issue, the Ceronix XX0X-LCD has been tested with popular VGA cards and various gaming machines. The compatibility can be up-dated as soon as a new signal can be evaluated. The following procedure should be followed if the controller board is not displaying an image correctly.

It is best to display an image that has a full window of active video. This allows the monitor to detect and center the image on the display.

If the image does not fill the screen and center itself after power up, press the "SELECT" button. The display will attempt to adjust the image so that it fills the screen. If the image is centered and fills the screen, try recycling the power to the display. If the image appears centered and fills the screen, then the auto-detect functioned properly.

7. Application Timing

If the image is shifted or does not fill the screen after cycling the power, please try the following. Using the OSD buttons, navigate to the image adjustment window (see below)



Using the “LEFT RIGHT”, “DOWN UP”, and “HORIZONTAL SIZE” functions, adjust the display so that the image is centered and fills the screen. Press the “MENU” button the suppress the OSD. Cycle power to the display. If the image appears centered and fills the screen then the monitor has stored the new settings properly.

If the image is shifted or does not fill the screen after cycling the power, please contact Ceronix and provide the following information.

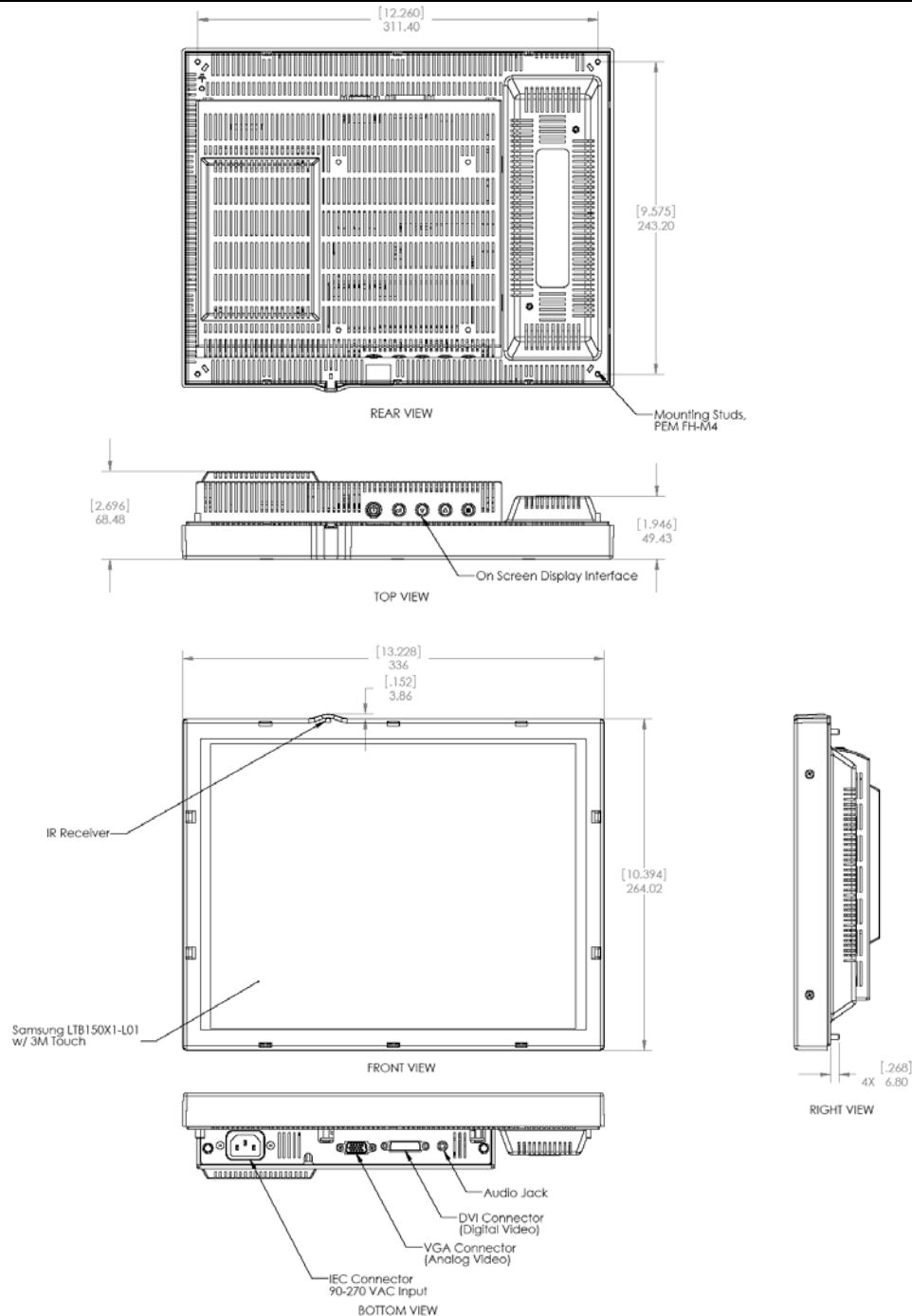
VIDEO SOURCE (CHECK ONE)	VIDEO CARD	GAMING MACHINE
MANUFACTURER		
MODEL NUMBER		
DATE OF MANUFACTURE		
NAME OF GAME		
RESOLUTION		
HORIZONTAL FREQUENCY		
H-SYNC PULSE WIDTH		
H-SYNC PULSE DELAY		
VERTICAL FREQUENCY		
V-SYNC PULSE WIDTH		
V-SYNC PULSE DELAY		



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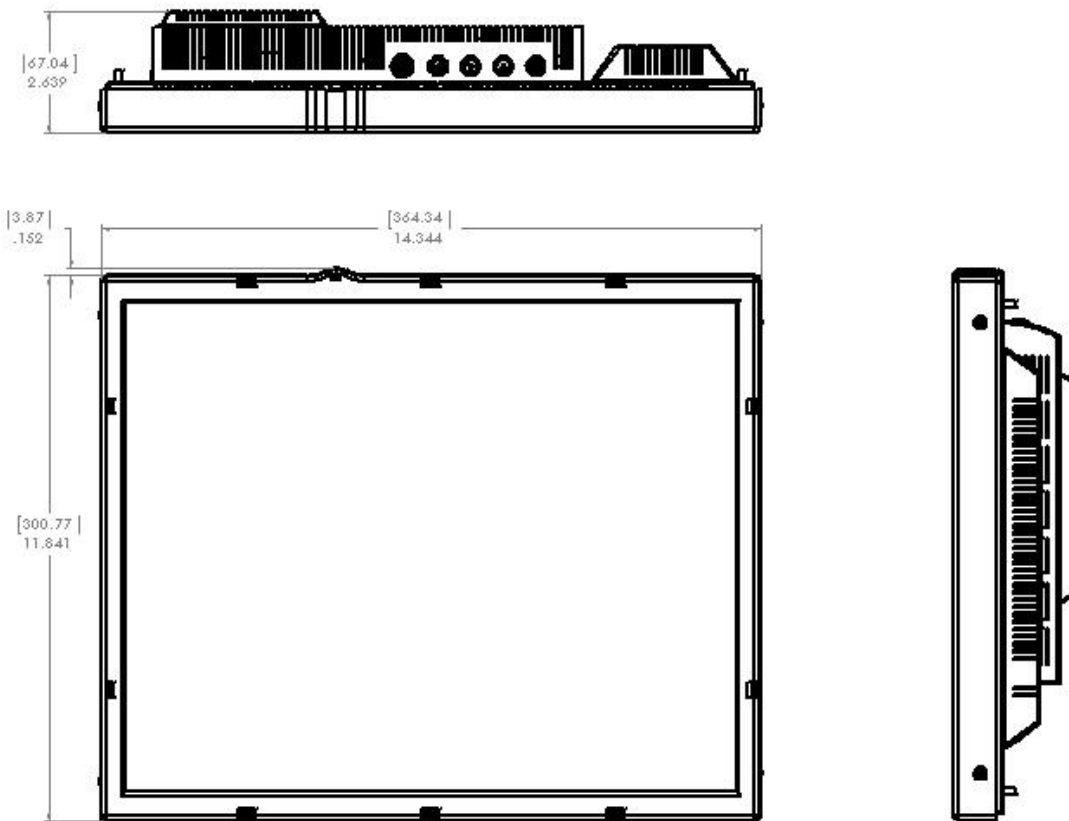
8. Mechanical & Environmental Specifications

Dimensions (W x H x D)	10.394" x 13.228" x 2.696" (150X-LCD)
Environment	Operational 0° to 70°C, Humidity 5% to 90% Non-Condensing



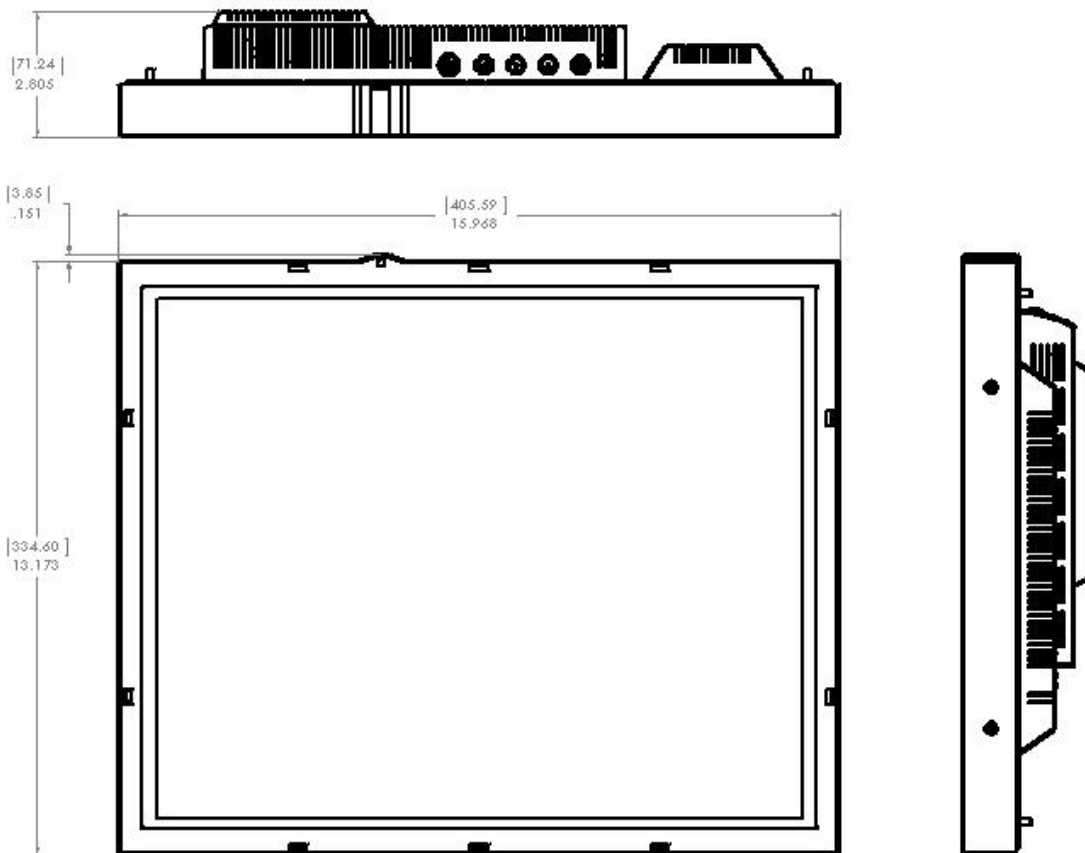
8. Mechanical & Environmental Specifications

Dimensions (W x H x D)	14.344" x 11.841" x 2.639" (170X-LCD) TN
Environment	Operational 0° to 70°C, Humidity 5% to 90% Non-Condensing



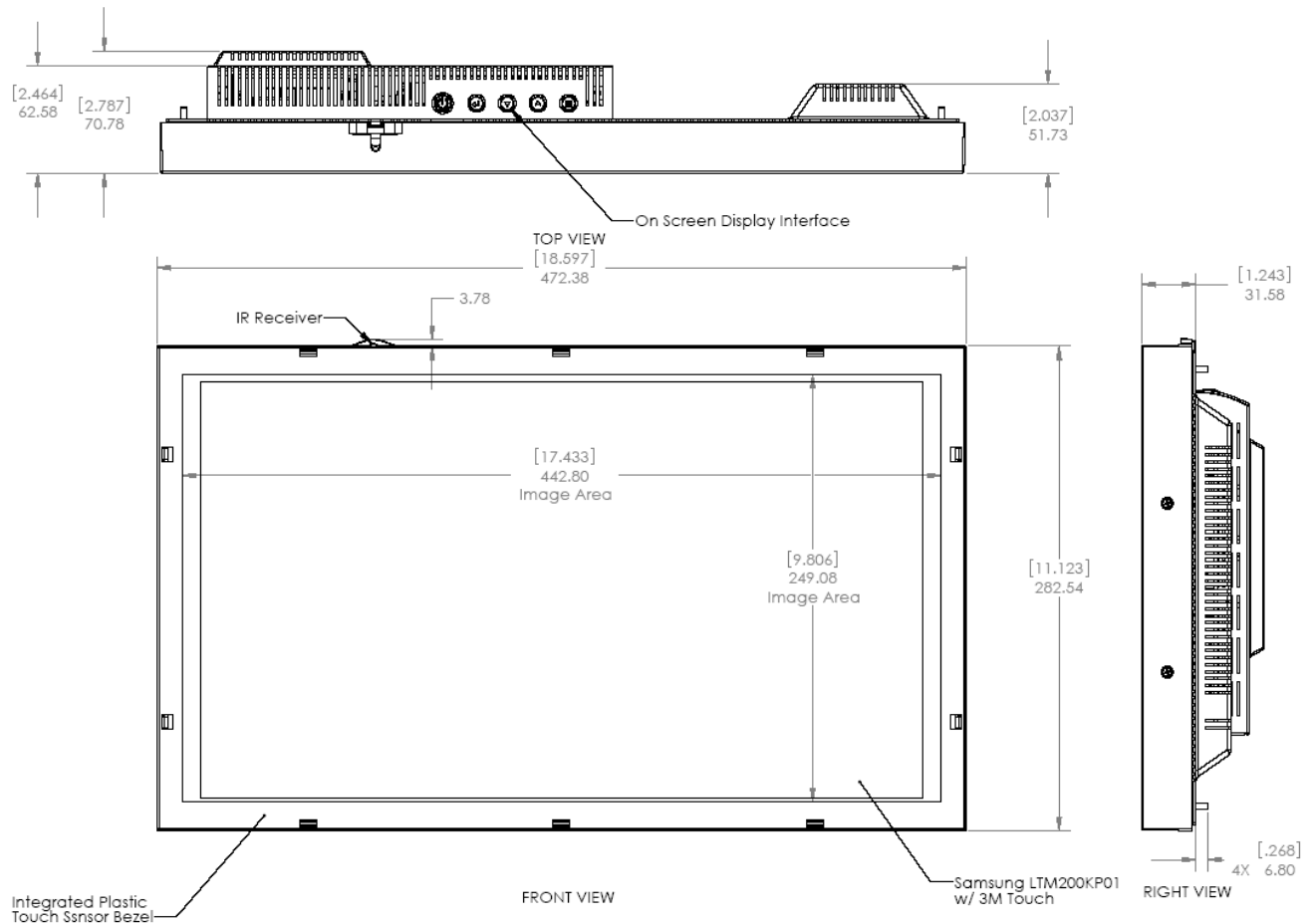
8. Mechanical & Environmental Specifications

Dimensions (W x H x D)	15.968" x 13.173" x 2.805" (190X-LCD)
Environment	Operational 0° to 70°C, Humidity 5% to 90% Non-Condensing



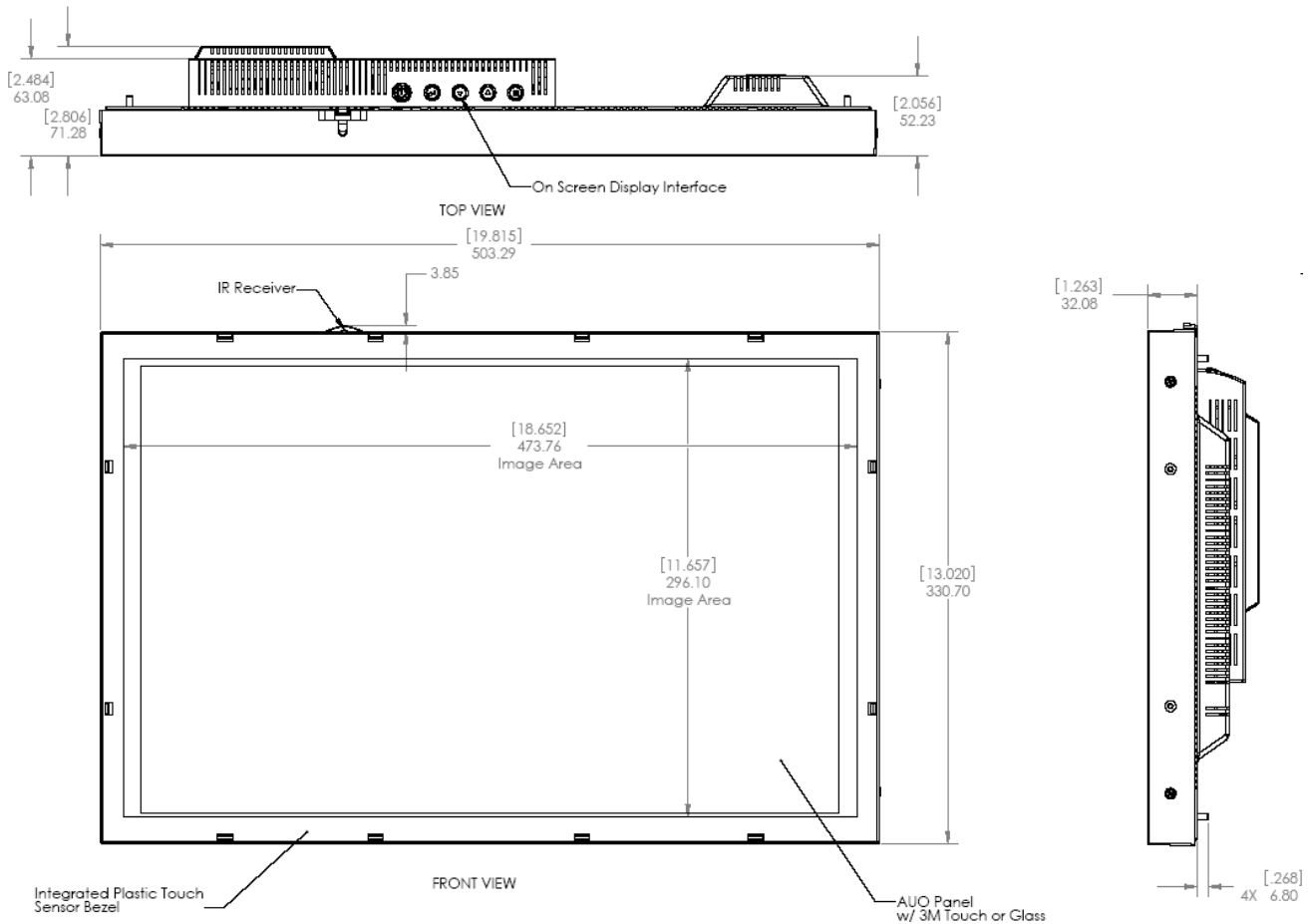
8. Mechanical & Environmental Specifications

Dimensions (W x H x D)	18.597" x 11.123" x 2.787" (200X-LCD)
Environment	Operational 0° to 70°C, Humidity 5% to 90% Non-Condensing



8. Mechanical & Environmental Specifications

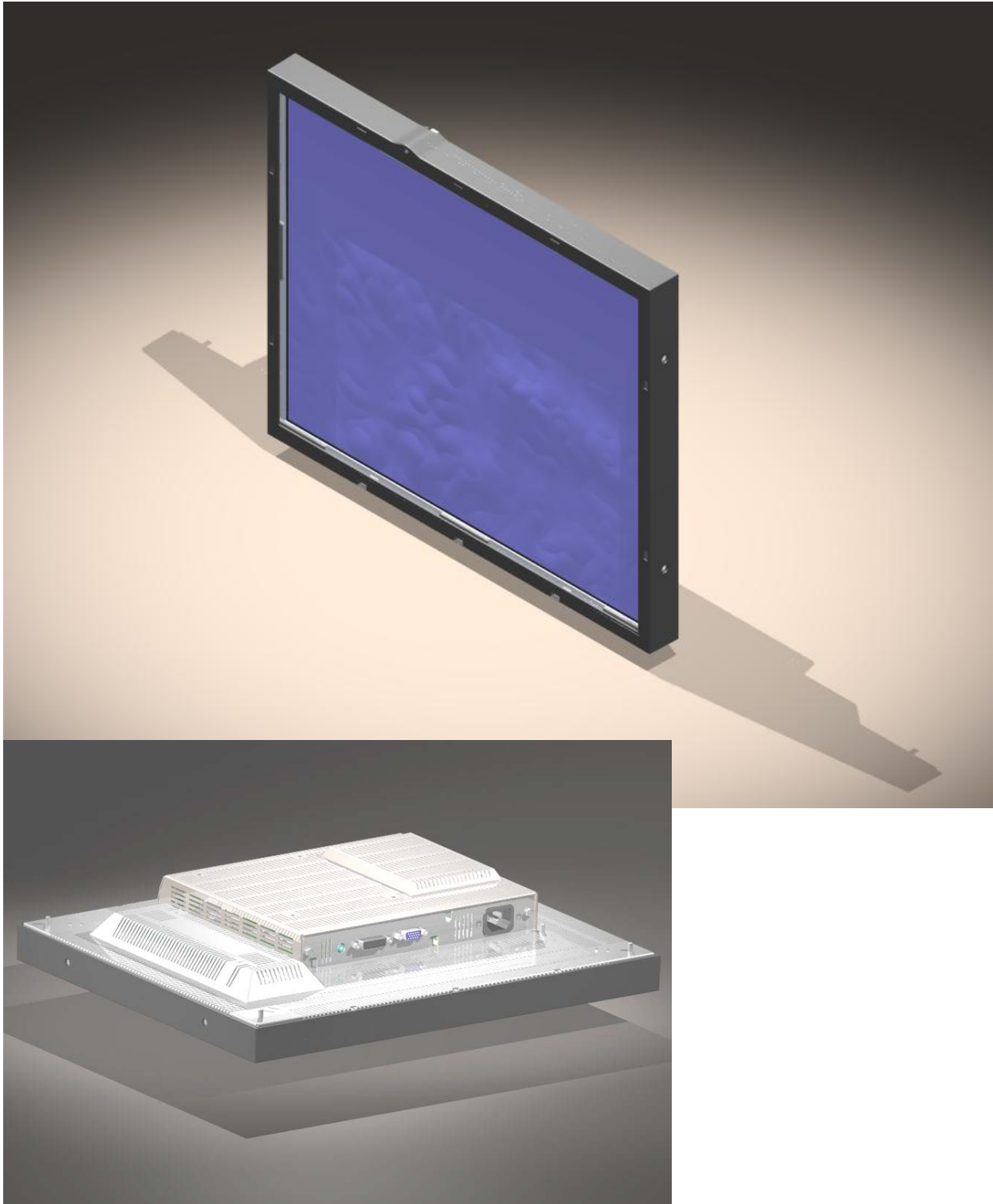
Dimensions (W x H x D)	19.815" x 13.020" x 2.806" (2200X-LCD)
Environment	Operational 0° to 70°C, Humidity 5% to 90% Non-Condensing





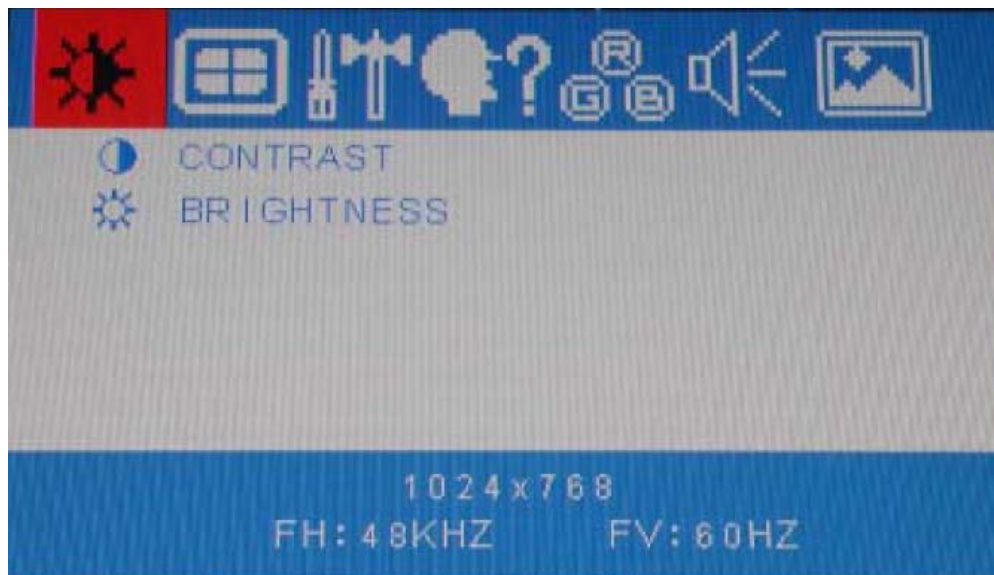
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9. Mechanical Rendering



10. OSD Navigation

CONTRAST	ADJUSTS RGB GAIN
BRIGHTNESS	ADJUSTS BACKLIGHT



10. OSD Navigation

AUTO ADJUST	AUTOMATICALLY ADJUSTS IMAGE TO FILL SCREEN
LEFT RIGHT	ADJUSTS IMAGE POSITION TO THE LEFT OR RIGHT
DOWN UP	ADJUSTS IMAGE POSITION UP OR DOWN
HORIZONTAL SIZE	ADJUSTS HORIZONTAL SIZE
FINE	ADJUSTS CLOCK FOR FINE HORIZONTAL SIZE
VGA	CHANGE SOURCE TO VGA CONNECTOR
DVI	CHANGE SOURCE TO DVI CONNECTOR



10. OSD Navigation

OSD LEFT RIGHT	ADJUSTS OSD POSITION TO THE LEFT OR RIGHT
OSD DOWN UP	ADJUSTS OSD POSITION UP OR DOWN
OSD TIMEOUT	ADJUSTS OSD DISPLAY TIME
OSD COLOR	ADJUSTS COLOR OF OSD IMAGE
FACTORY RESET	RECALLS FACTORY ADJUSTMENT DATA



10. OSD Navigation

ENGLISH	SELECT OSD FOR ENGLISH LANGUAGE
FRENCH	SELECT OSD FOR FRENCH LANGUAGE
GERMAN	SELECT OSD FOR GERMAN LANGUAGE
ITALIAN	SELECT OSD FOR ITALIAN LANGUAGE
SPANISH	SELECT OSD FOR SPANISH LANGUAGE
JAPANESE	SELECT OSD FOR JAPANESE LANGUAGE
CHINESE TRADITIONAL	SELECT OSD FOR CHINESE TRADITIONAL LANGUAGE
CHINESE SIMPLE	SELECT OSD FOR CHINESE SIMPLE LANGUAGE



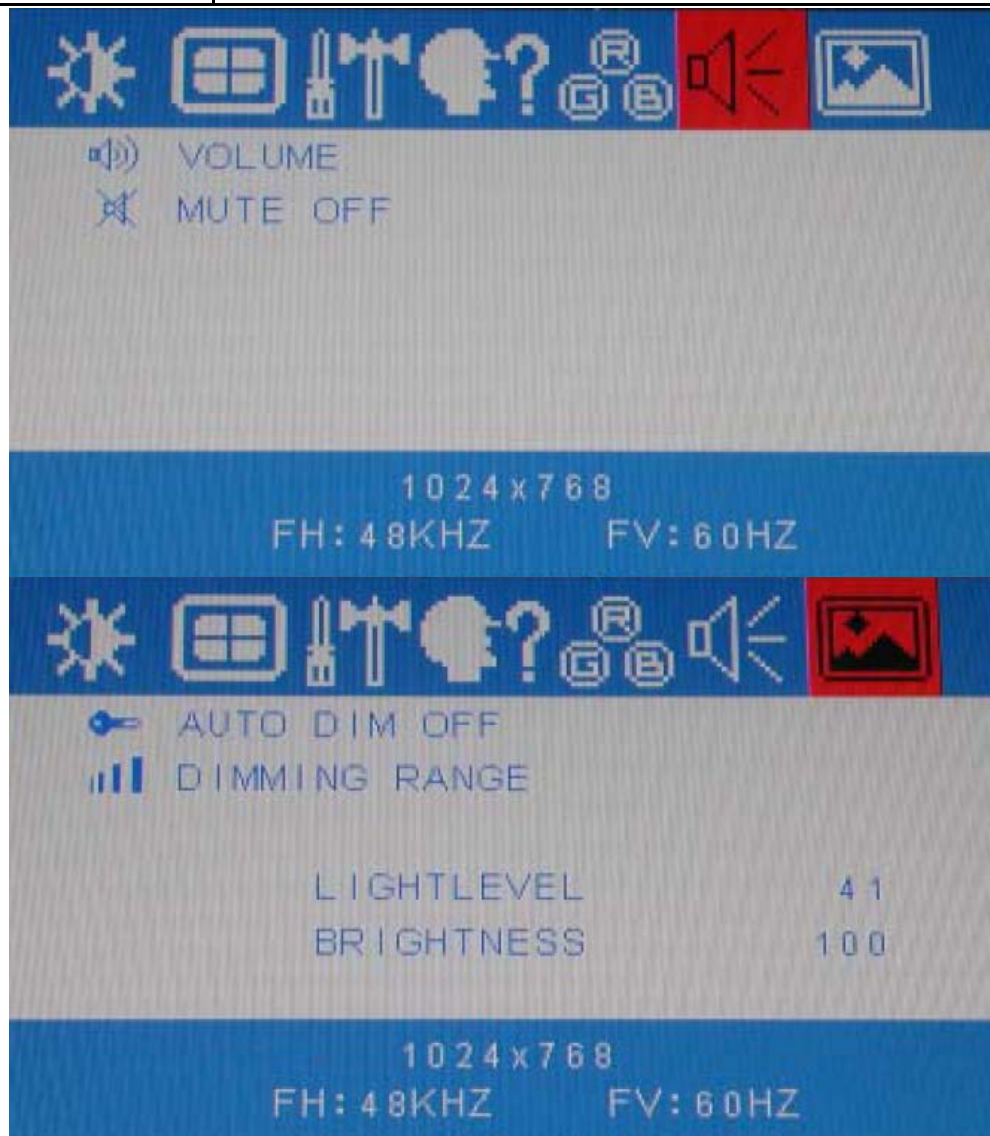
10. OSD Navigation

9300	SELECT FOR 9300°K COLOR TEMPERATURE
6500	SELECT FOR 6500°K COLOR TEMPERATURE
5500	SELECT FOR 5500°K COLOR TEMPERATURE
7500	SELECT FOR 7500°K COLOR TEMPERATURE
USER	SELECT FOR USER ADJUST COLOR TEMPERATURE
USER RED	SELECT FOR USER ADJUST RED
USER GREEN	SELECT FOR USER ADJUST GREEN
USER BLUE	SELECT FOR USER ADJUST BLUE



10. OSD Navigation

VOLUME	ADJUSTMENT NOT AVAILABLE ON THIS MODEL
MUTE OFF	ADJUSTMENT NOT AVAILABLE ON THIS MODEL
AUTO DIM OFF	ADJUSTMENT NOT AVAILABLE ON THIS MODEL
DIMMING RANGE	ADJUSTMENT NOT AVAILABLE ON THIS MODEL



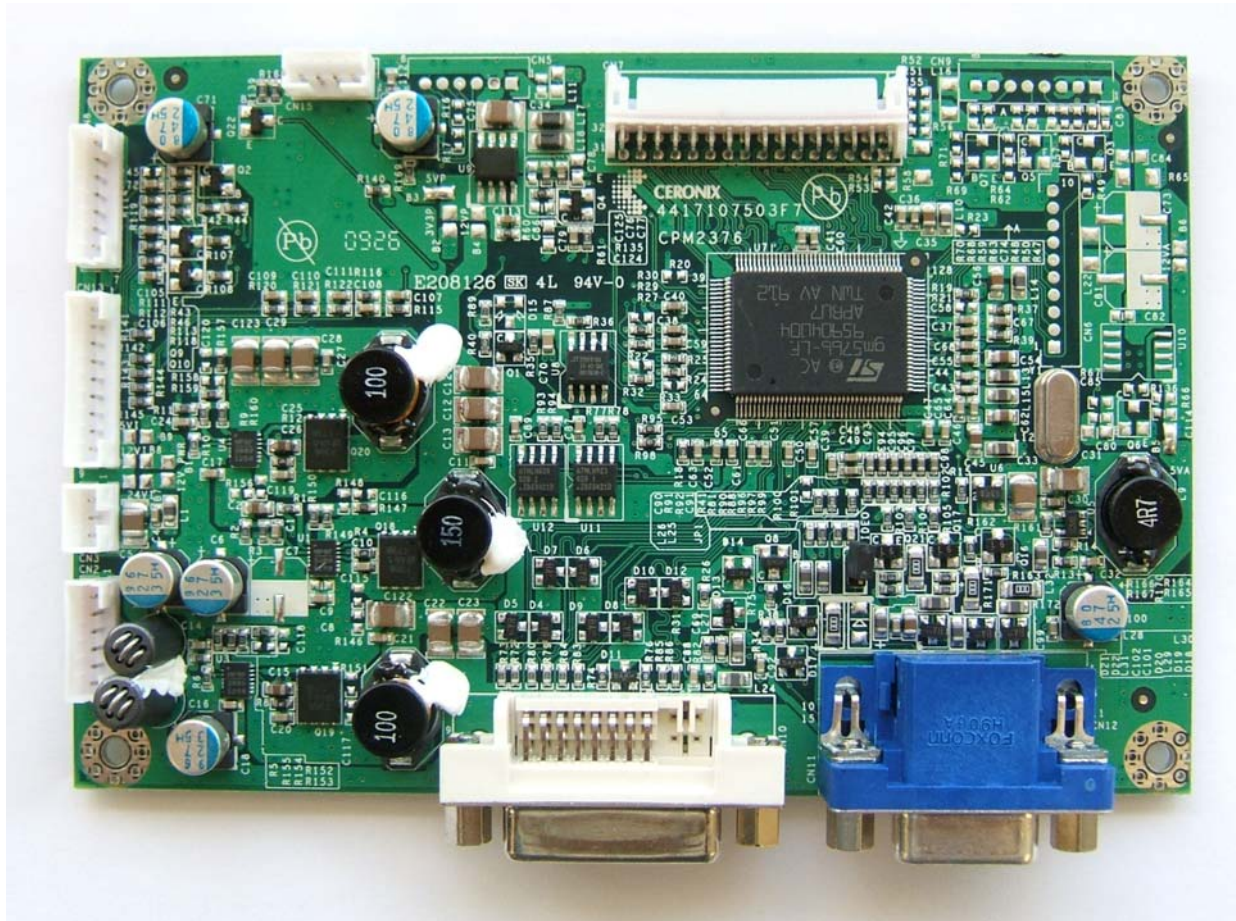
11. Burn-In Mode

When no signal is input to the display unit, it is possible to use on-board image generator to display alternating full color windows. This is accomplished by pressing the “MENU” button and “POWER” button at the same time. It is possible to escape from this mode by reapplying a valid input signal.



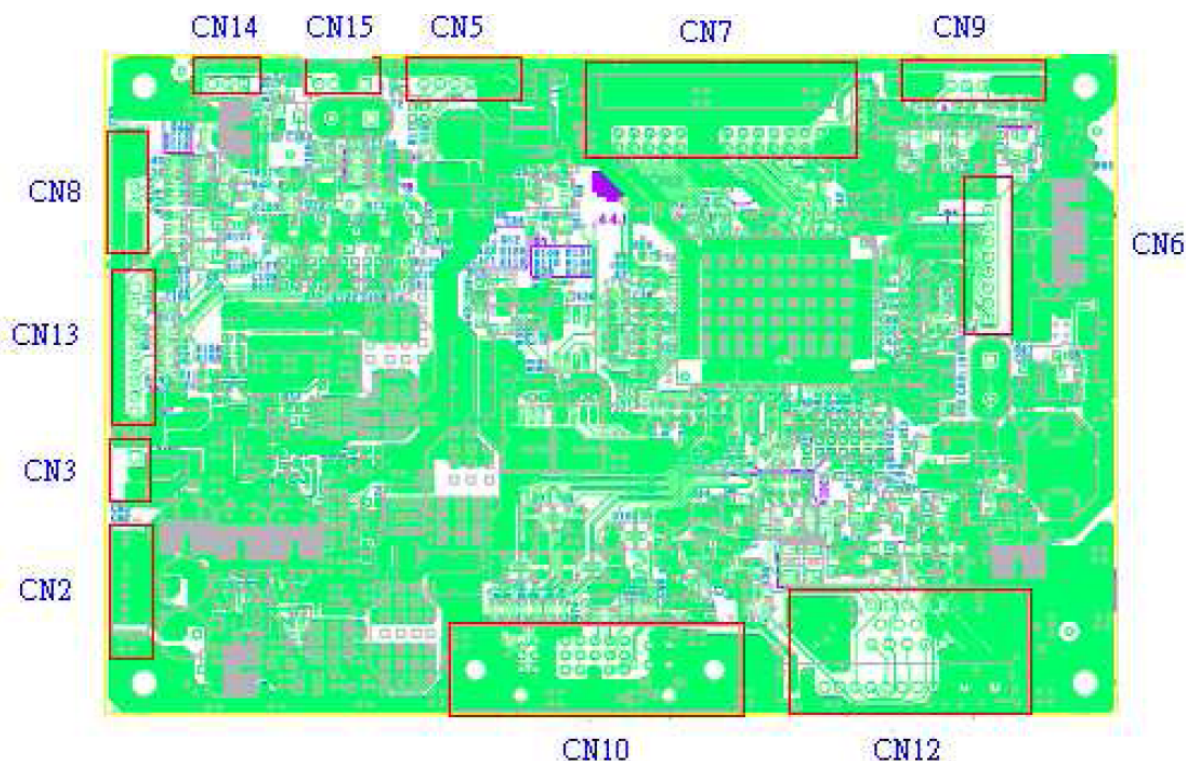
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12. A/D Controller Board Ceronix Part Number CPM2376



CONNECTOR	DESCRIPTION	PIN COUNT
CN1	TOUCH POWER	3
CN3	DC INPUT	2
CN4	OSD KEY PAD	10
CN5	INVERTER CONTROL	5
CN6	IR BOARD	6
CN8	LCD LVDS	32
CN9	DVI INPUT	24
CN11	VGA ANALOG INPUT	15

13. A/D Controller Board Pin Description



CONNECTOR	DESCRIPTION	PIN COUNT
CN2	24VDC INPUT	6
CN3	TOUCH POWER	3
CN5	GPIO, UART	6
CN6	VIDEO ITU656, LIGHT SENSOR	10
CN7	LCD LVDS	32
CN8	INVERTER	7
CN9	AUDIO	8
CN10	DVI-D	24
CN12	VGA	15
CN13	OSD KEY	9
CN15	IR RECEIVER	15

13. A/D Controller Board Pin Description

CN2 24VDC INPUT	
PIN	FUNCTION
1	+24 VDC
2	+24 VDC
3	+24 VDC
4	GROUND
5	GROUND
6	GROUND

CN3 TOUCH POWER	
PIN	FUNCTION
1	+12VDC
2	+5VDC
3	GROUND

CN5 GPIO, UART	
PIN	FUNCTION
1	+5VDC
2	GROUND
3	DI
4	DO
5	GPIO
6	GPIO

13. A/D Controller Board Pin Description

CN6 VIDEO ITU656, LIGHT SENSOR	
PIN	FUNCTION
1	DATA0
2	DATA1
3	DATA2
4	DATA3
5	DATA4
6	DATA5
7	DATA6
8	DATA7
9	GROUND
10	GROUND

CN8 INVERTER	
PIN	FUNCTION
1	+5/+12/+24
2	+5/+12/+24
3	+5/+12/+24
4	ADJUST
5	ON/OFF
6	GROUND
7	GROUND

13. A/D Controller Board Pin Description

CN7 LCD LVDS			
PIN	FUNCTION	PIN	FUNCTION
1	PANEL VCC	17	GROUND
2	PANEL VCC	18	GROUND
3	PANEL VCC	19	RXOCKIN-
4	OPTION	20	GROUND
5	OPTION	21	RXO1N3+
6	OPTION	22	RXO1N3-
7	RXE1N3+	23	RXOCKIN+
8	RXE1N3-	24	RXOCKIN-
9	RXECKIN+	25	RXO1N2+
10	RXECKIN-	26	RXO1N2-
11	RXE1N2+	27	RXO1N1+
12	RXE1N2-	28	RXO1N1-
13	RXE1N1+	29	RXO1N0+
14	RXE1N1-	30	RXO1N0-
15	RXE1N0+	31	GROUND
16	RXE1N0-	32	GROUND

13. A/D Controller Board Pin Description

CN9 AUDIO	
PIN	FUNCTION
1	AMPLIFIER POWER
2	AMPLIFIER POWER
3	AMPLIFIER POWER
4	VOLUME CONTROL
5	MUTE
6	STBY
7	GROUND
8	GROUND

CN10 LCD DVI-D			
PIN	FUNCTION	PIN	FUNCTION
1	RX2-_IN	16	HOT PLUG DETECT
2	RX2+_IN	17	RX0-_IN
3	GROUND	18	RX0+_IN
4	NC	19	GROUND
5	NC	20	NC
6	DDC-SCL	21	NC
7	DDC-SDA	22	GROUND
8	NC	23	RXC+_IN
9	RX1-_IN	24	RXC-_IN
10	RX1+_IN	C1	NC
11	GROUND	C2	NC
12	NC	C3	NC
13	NC	C4	NC
14	DVI +5V	C5	GROUND
15	GROUND	C6	GROUND

13. A/D Controller Board Pin Description

CN12 VGA 15P D-SUB			
PIN	FUNCTION	PIN	FUNCTION
1	RED VIDEO	9	+5VDC (DDC)
2	GREEN VIDEO	10	GROUND
3	BLUE VIDEO	11	NC
4	NC	12	DDC-SDA
5	GROUND	13	HORIZONTAL SYNC
6	RED VIDEO GROUND	14	VERTICAL SYNC
7	GREEN VIDEO GROUND	15	DDC-SCL
8	BLUE VIDEO GROUND		

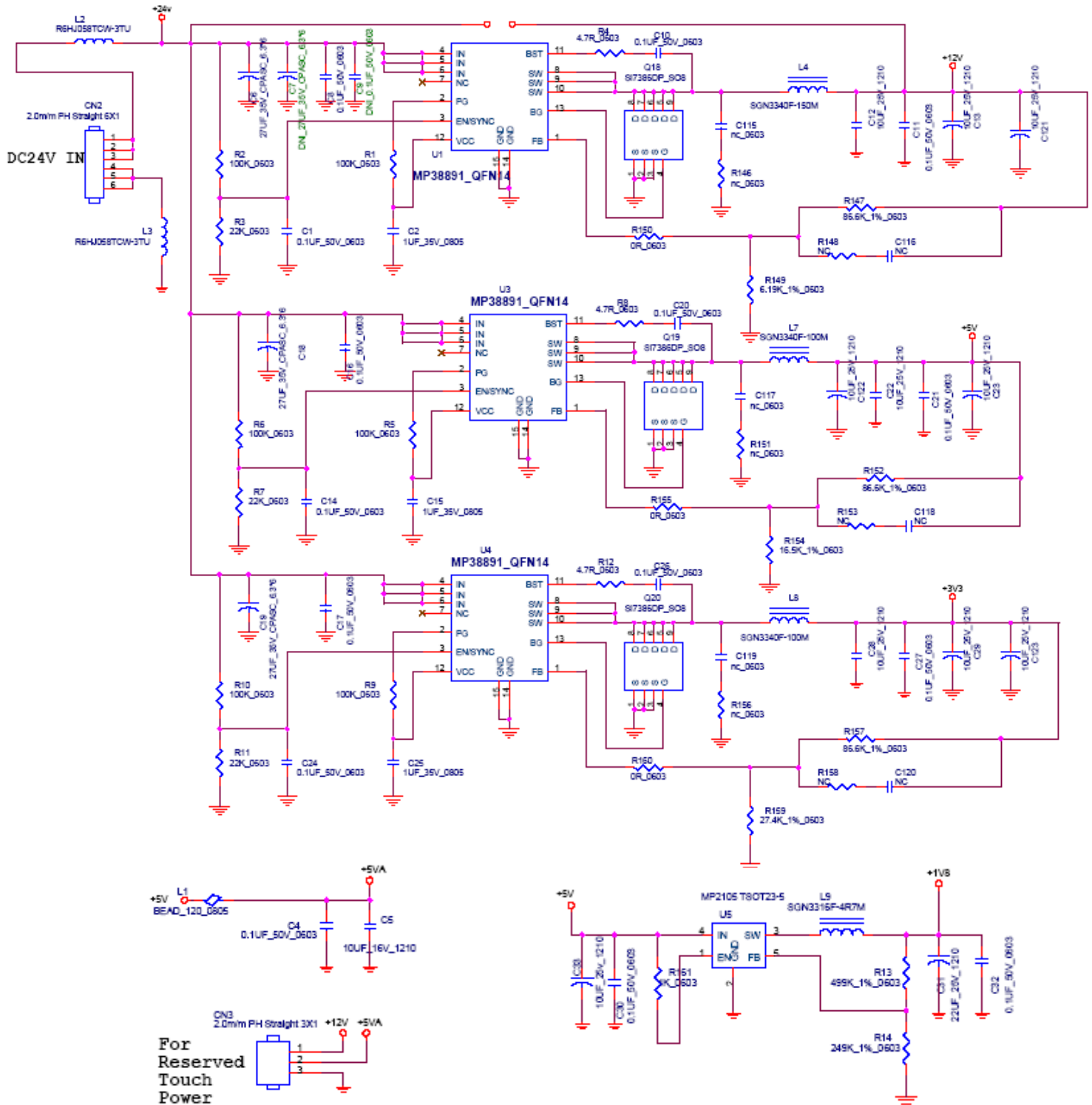
CN13 OSD KEY	
PIN	FUNCTION
1	POWER
2	GREEN LED
3	RED LED
4	AUTO/SEL
5	DOWN
6	UP
7	MENU
8	RESERVED
9	GROUND

CN15 IR RECEIVER	
PIN	FUNCTION
1	+5VDC
2	GROUND
3	+3.3VDC
4	IR DATA



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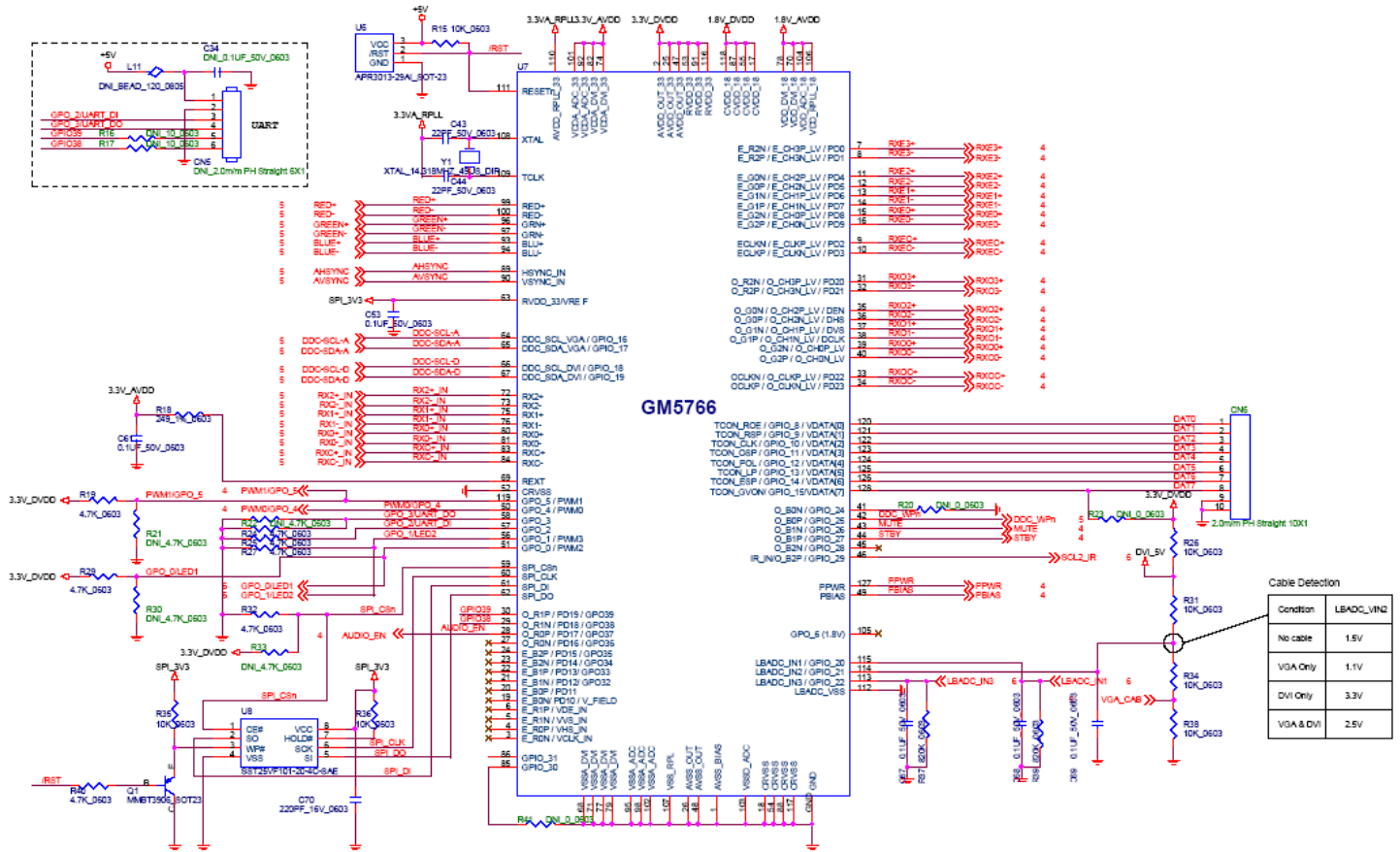
14. A/D Controller Schematics Power





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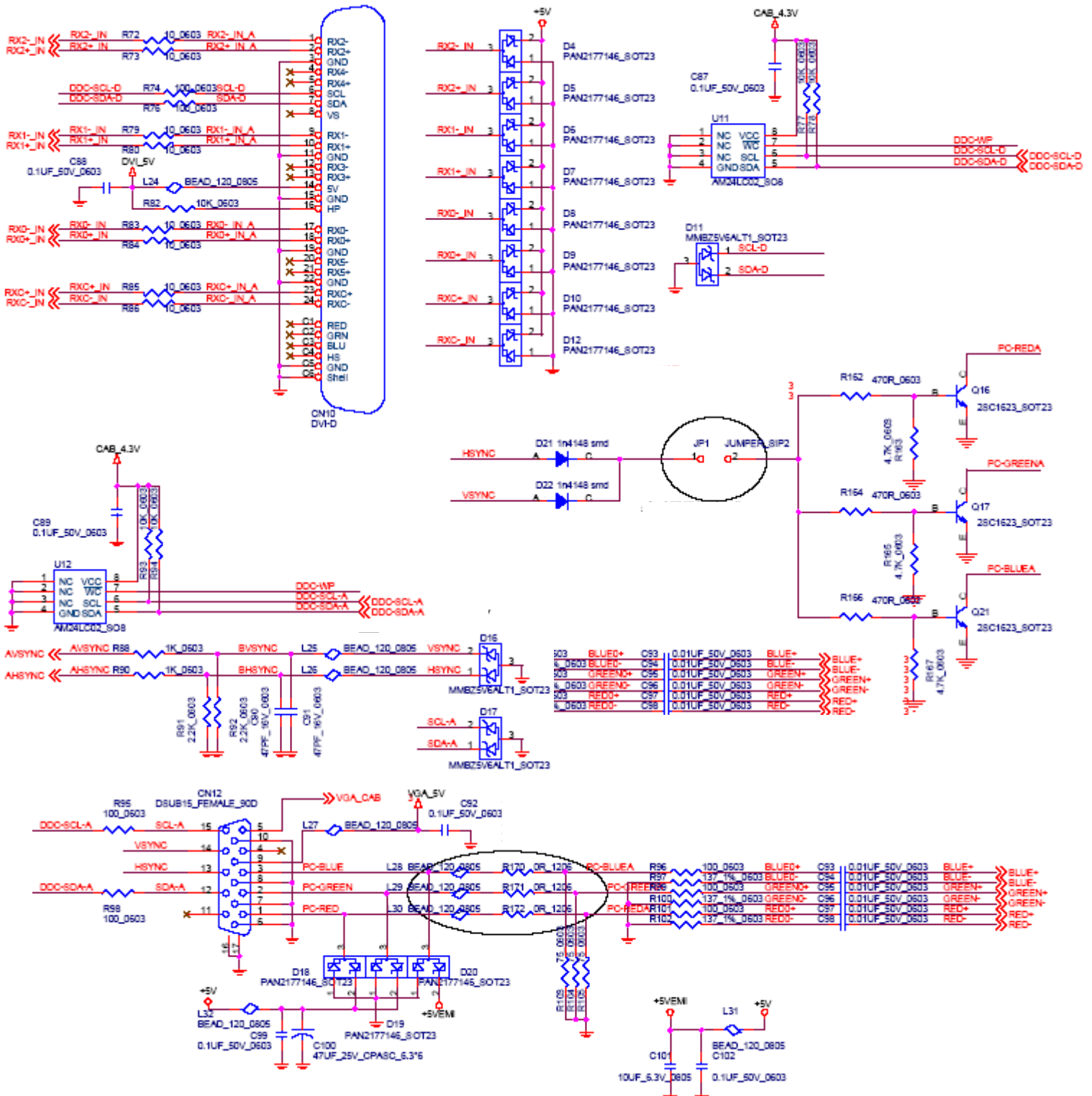
15. A/D Controller Schematics Scaler





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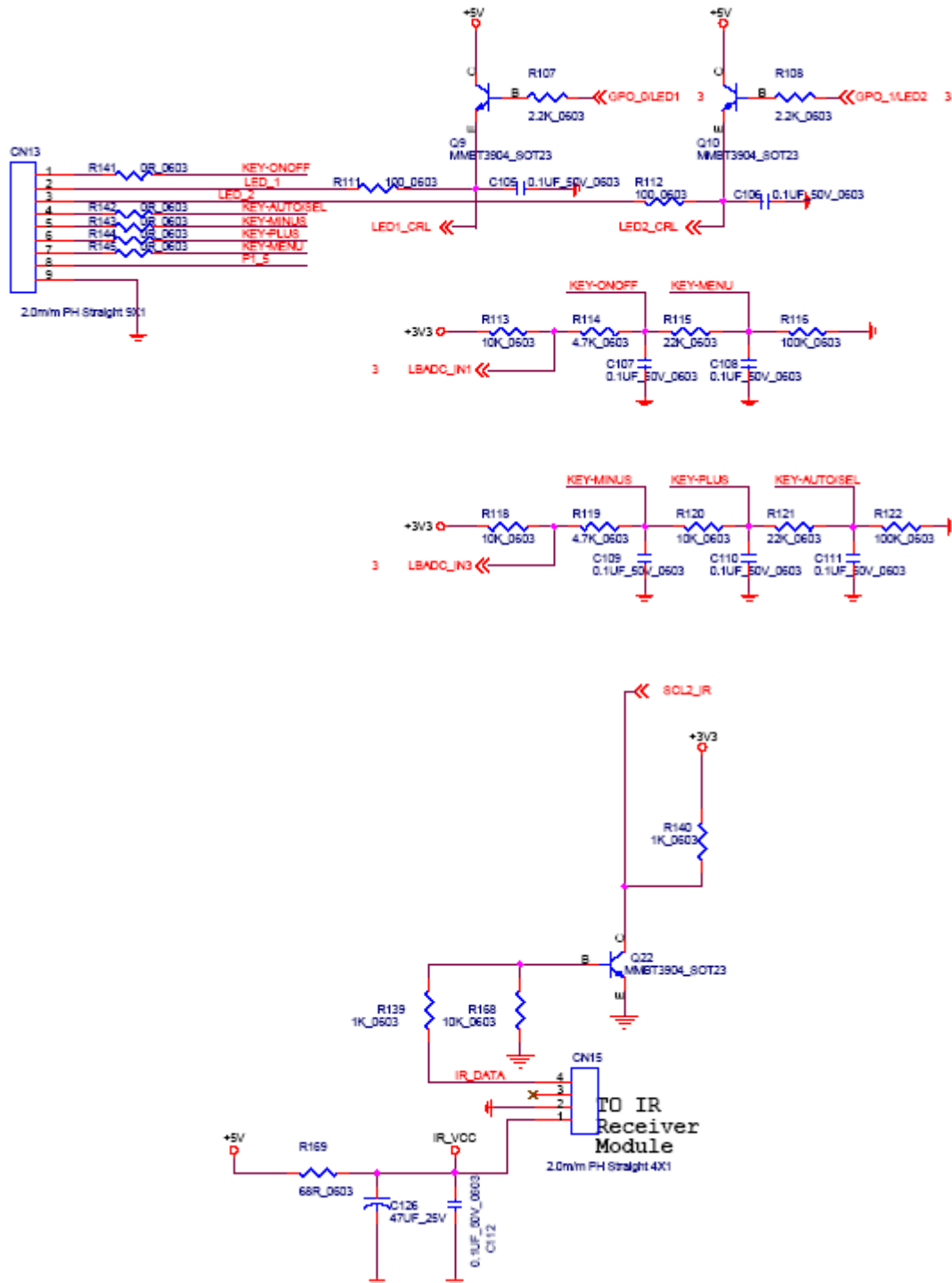
17. A/D Controller Schematics DSUB DVI INPUT





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18. A/D Controller Schematics KEY BUTTON, IR RECEIVER

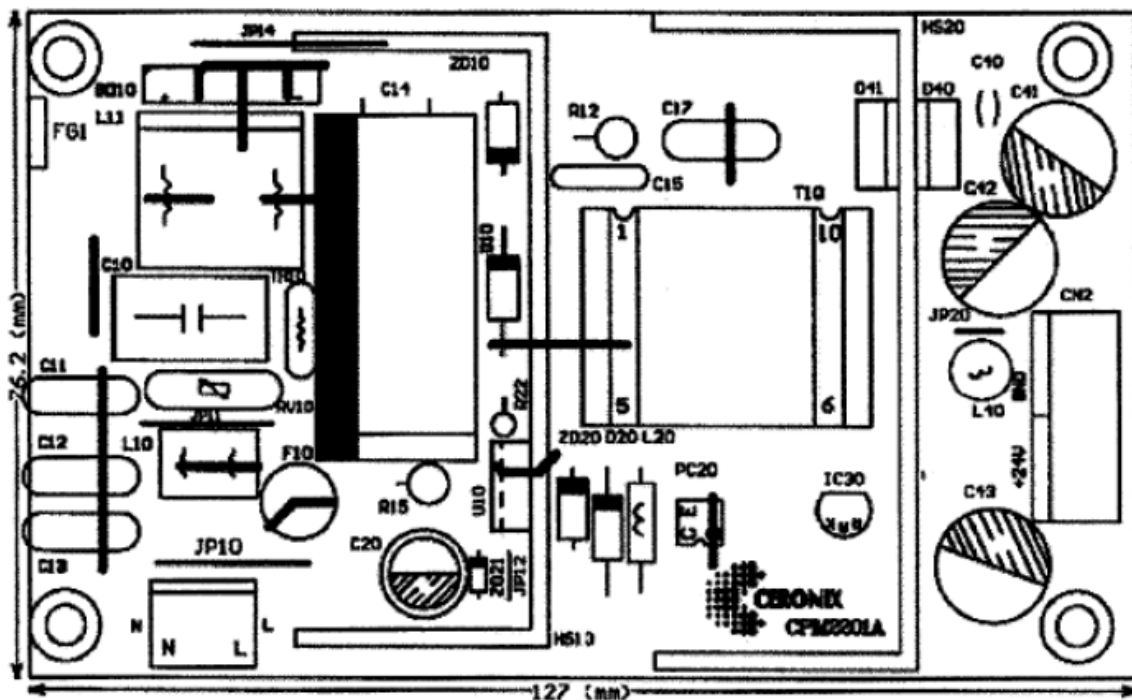




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19. A/C TO DC POWER SUPPLY CERONIX PART NUMBER CPM2201A

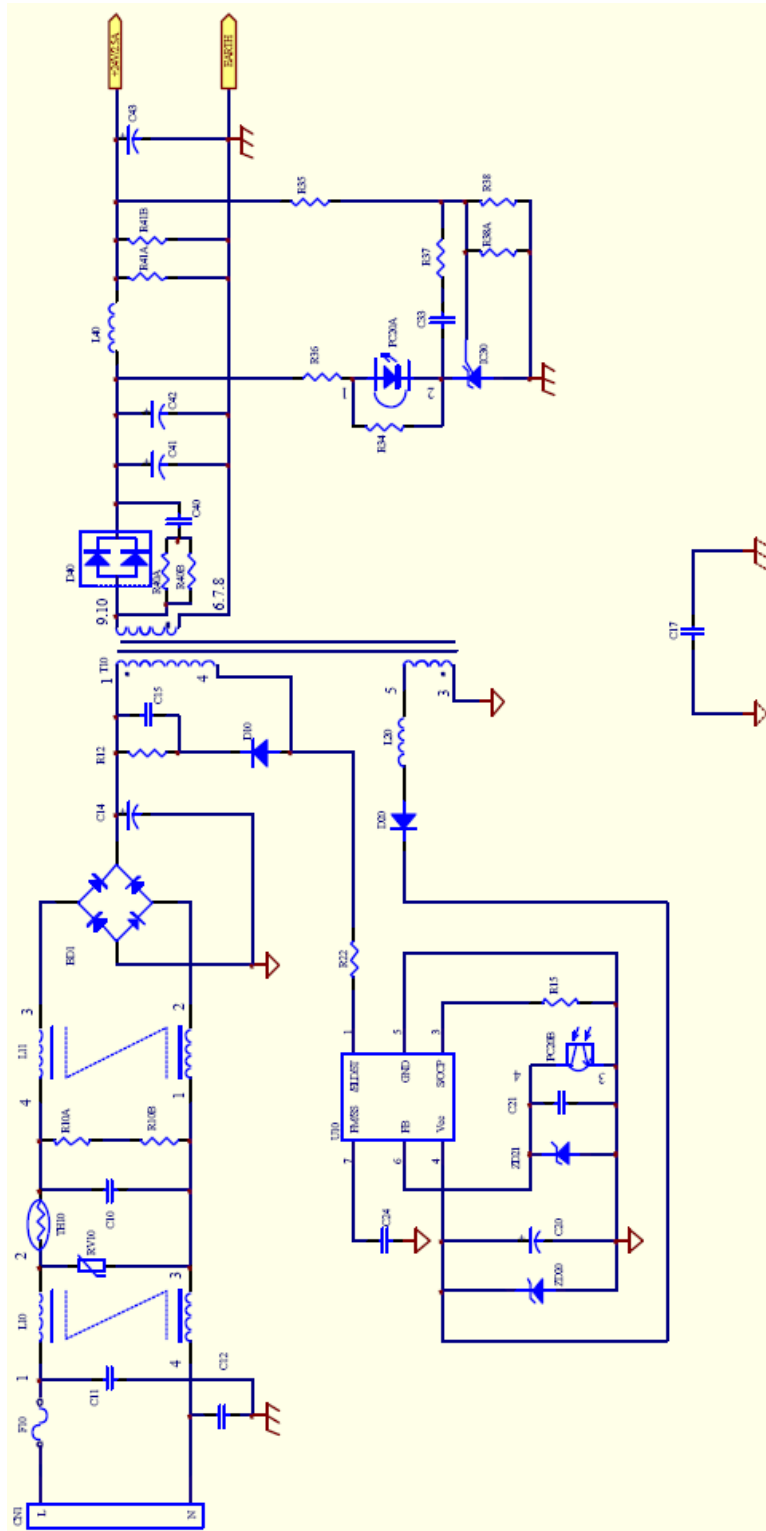
INPUT: 100-240VAC, 50-60Hz, 1.3A
OUTPUT: 24VDC, 2.5A





19. A/C TO DC POWER SUPPLY

CERONIX PART NUMBER CPM2201A SCHEMATIC

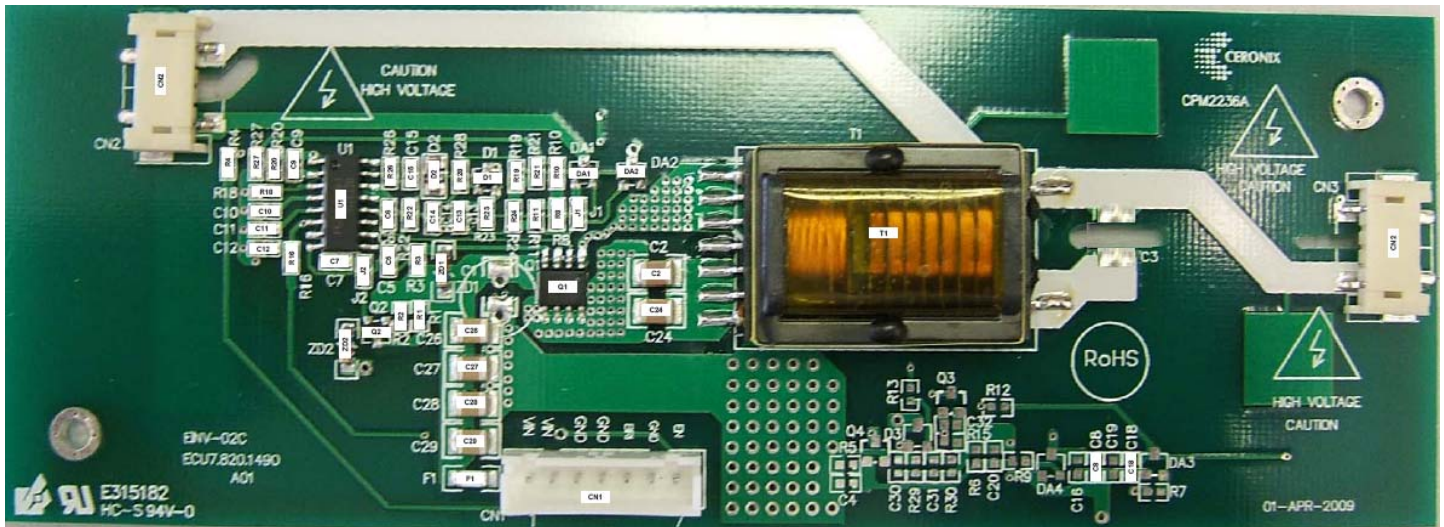




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20. 24V 2-LAMP INVERTER CERONIX PART NUMBER CPM2236A

INPUT: 24VDC, .45A
OUTPUT: CCFL LAMP CURRENT RANGE 3.5-8.0mA @ 50kHz



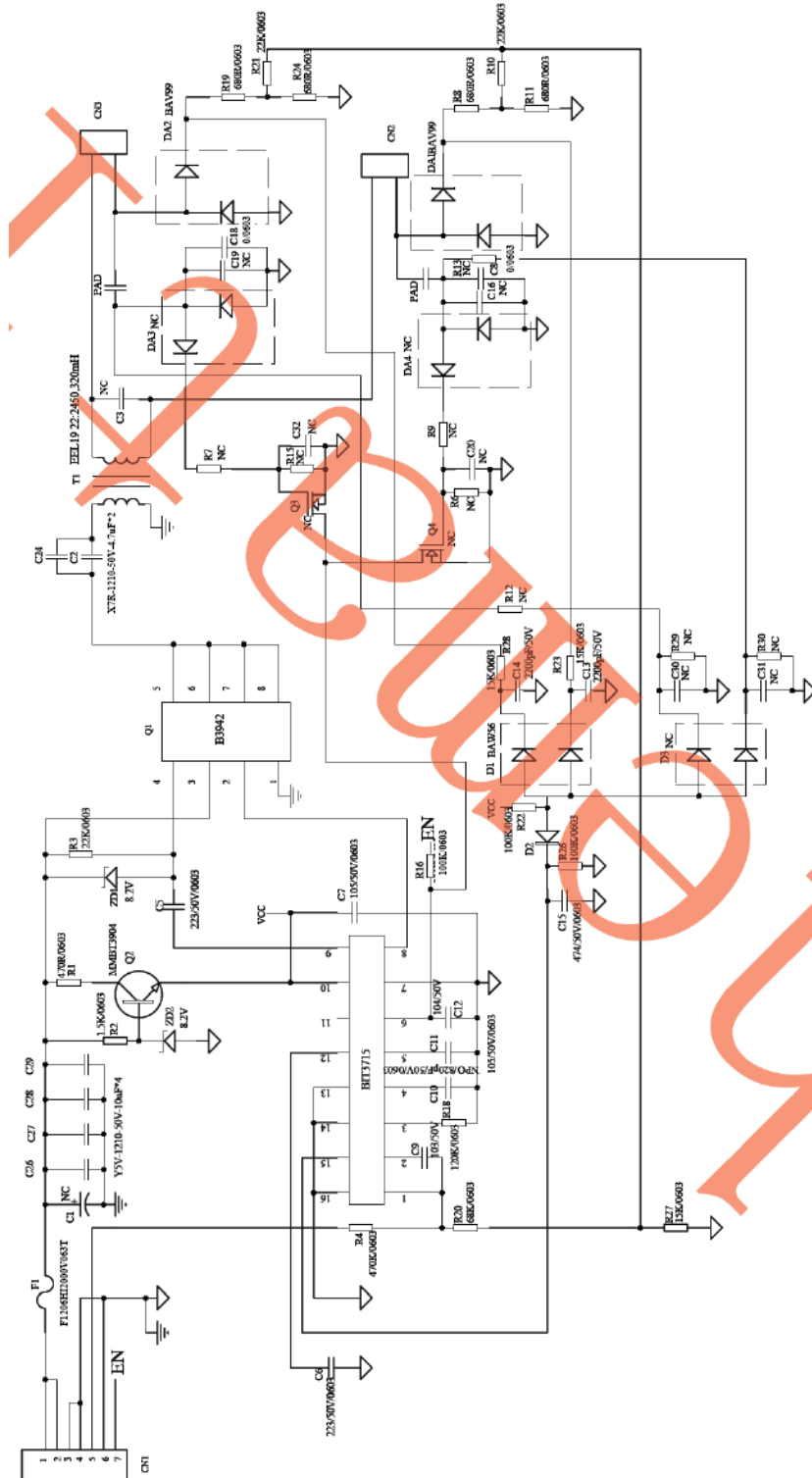
CN1 DC SUPPLY AND CONTROL	
PIN	FUNCTION
1	+24VDC
2	+24VDC
3	GROUND
4	GROUND
5	BRIGHT ADJUST
6	GROUND
7	ON/OFF CONTROL

CN2, CN3 CCFL LAMP CONNECTION	
PIN	FUNCTION
1	CCFL HIGH VOLTAGE
2	CCFL RETURN



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20. 24V 2-LAMP INVERTER SCHEMATIC CERONIX PART NUMBER CPM2236A

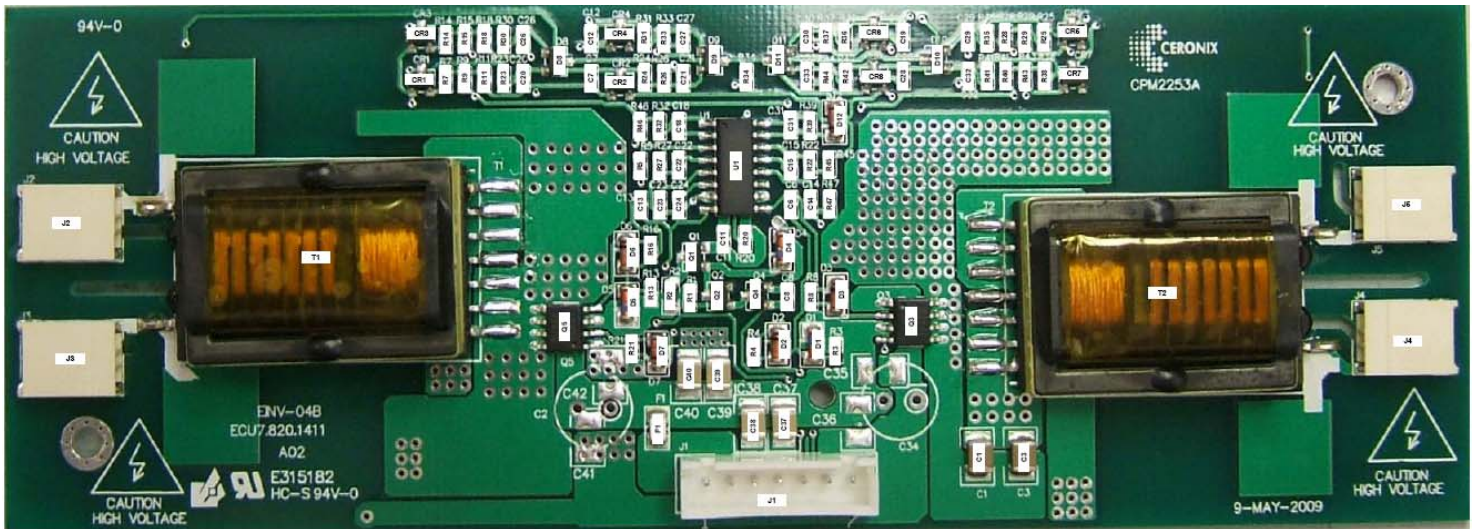




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21. 24V 4-LAMP INVERTER CERONIX PART NUMBER CPM2253A

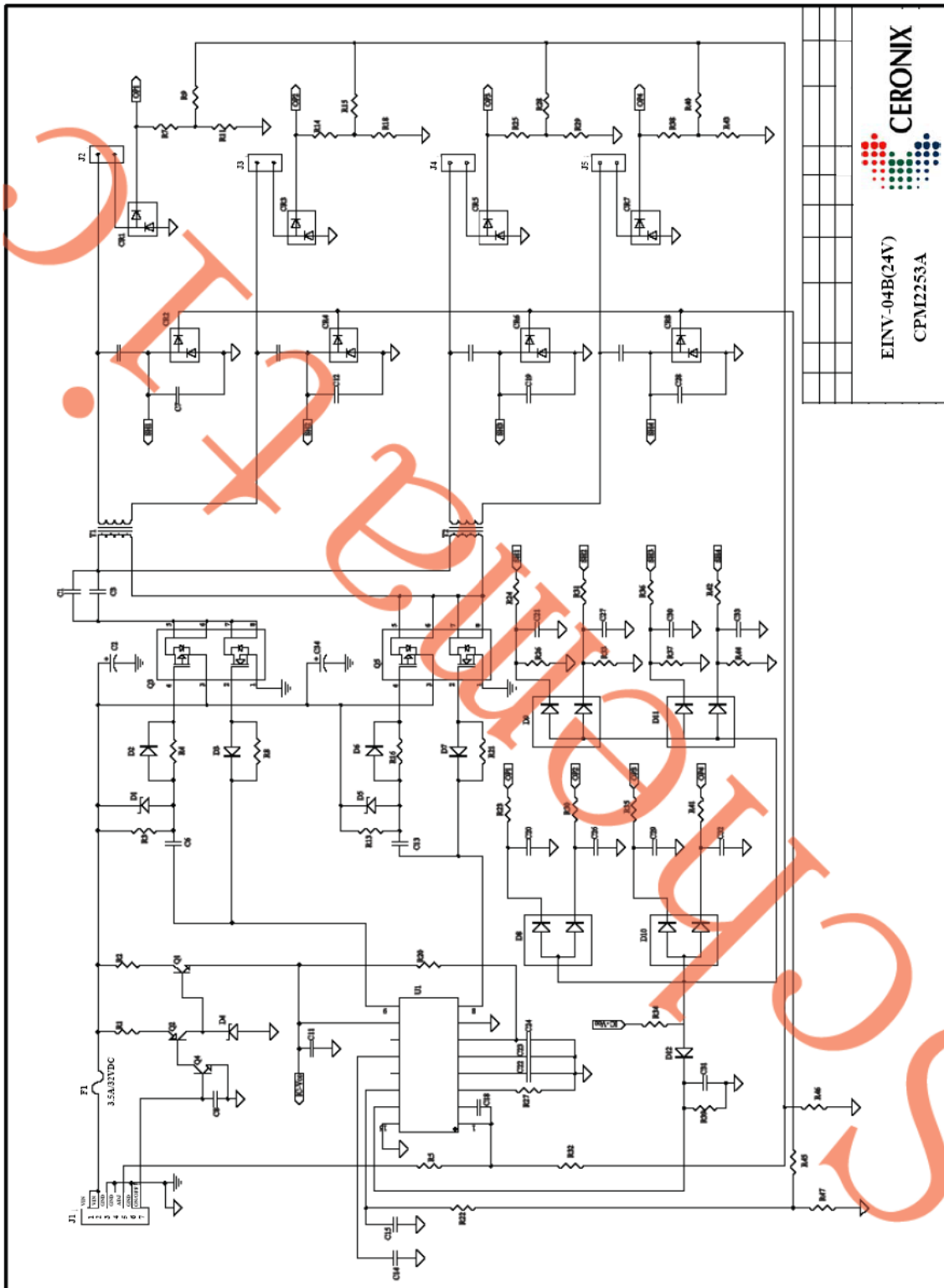
INPUT: 24VDC, 1.2A
OUTPUT: CCFL LAMP CURRENT RANGE 3.0-7.0mA @ 50kHz



CN1 DC SUPPLY AND CONTROL	
PIN	FUNCTION
1	+24VDC
2	+24VDC
3	GROUND
4	GROUND
5	BRIGHT ADJUST
6	GROUND
7	ON/OFF CONTROL

J2, J3, J4, J5 CCFL LAMP CONNECTION	
PIN	FUNCTION
1	CCFL HIGH VOLTAGE
2	CCFL RETURN

21. 24V 4-LAMP INVERTER SCHEMATIC CERONIX PART NUMBER CPM2253A

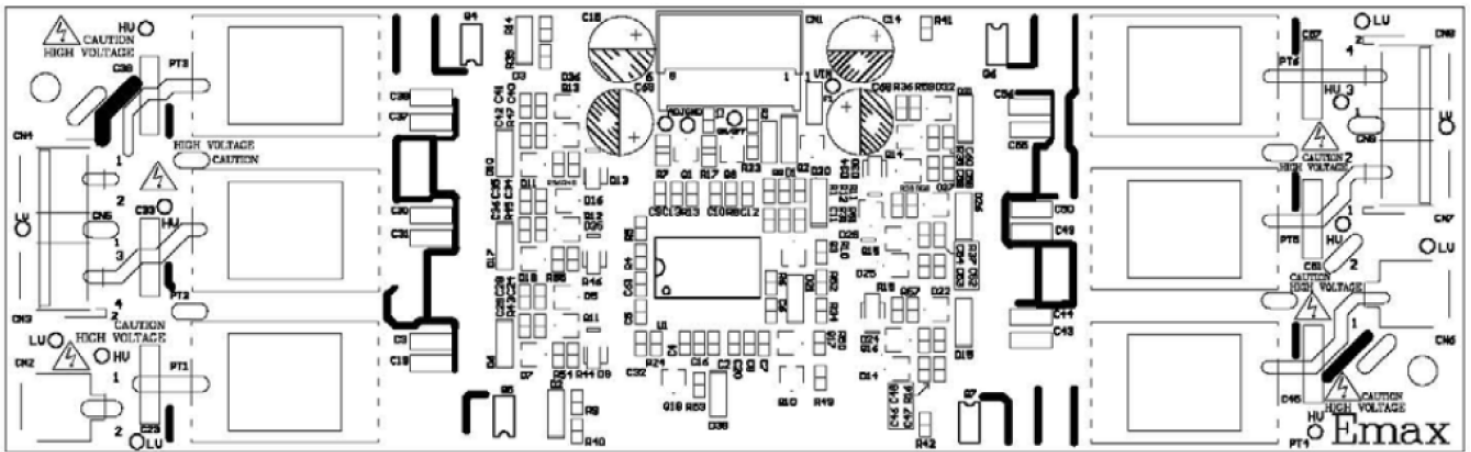




CERONIX

22. 24V 6-LAMP INVERTER CERONIX PART NUMBER CPM2469

INPUT: 24VDC, 1.52A
OUTPUT: CCFL LAMP CURRENT RANGE 3.8-6.6mA @ 47kHz



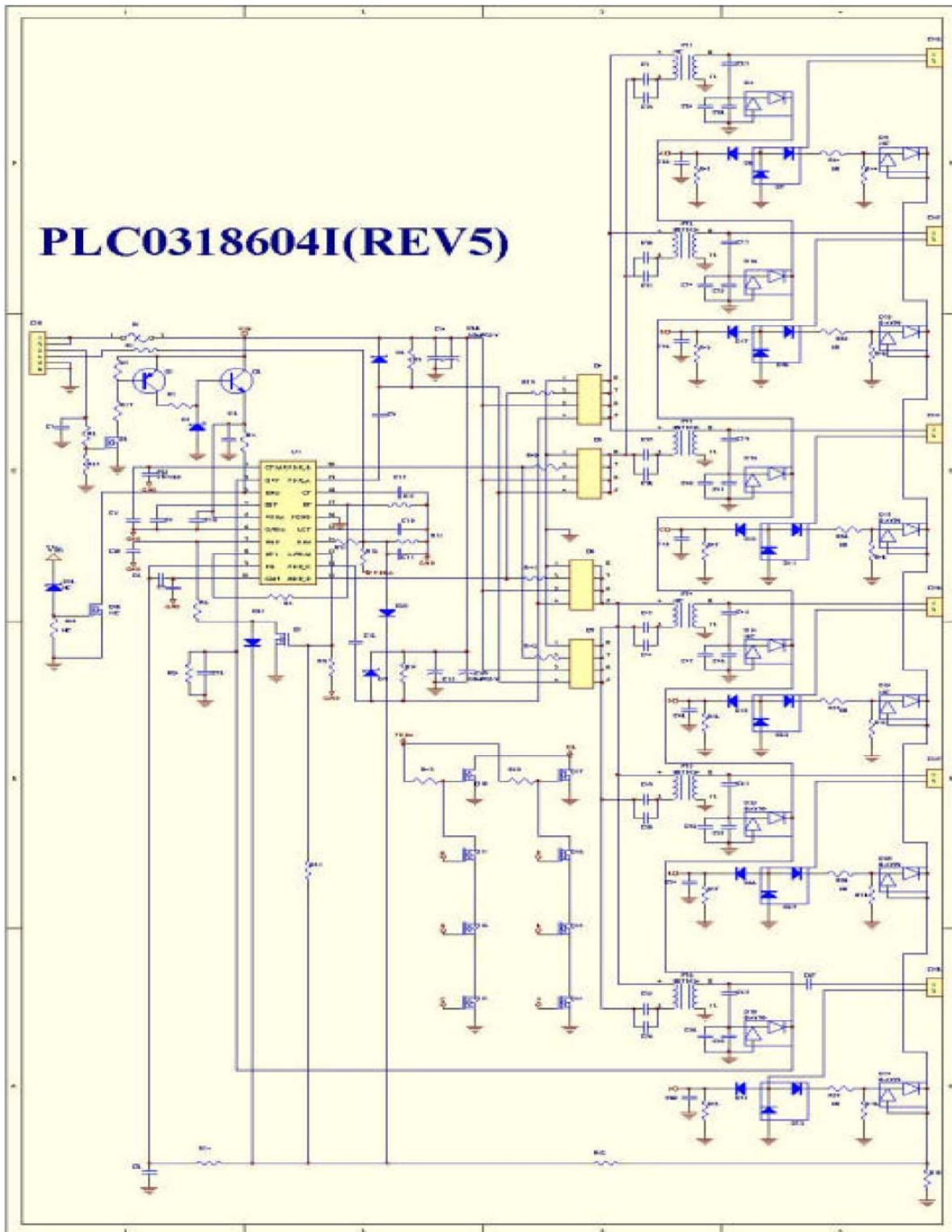
CN1 DC SUPPLY AND CONTROL	
PIN	FUNCTION
1	+24VDC
2	+24VDC
3	ON/OFF CONTROL
4	BRIGHT ADJUST
5	GROUND
6	GROUND

CN2, CN3, CN4, CN6, CN7, CN8 CCFL LAMP CONNECTION	
PIN	FUNCTION
1	CCFL HIGH VOLTAGE
2	CCFL RETURN



CERONIX

22. 24V 6-LAMP INVERTER SCHEMATIC CERONIX PART NUMBER CPM2469

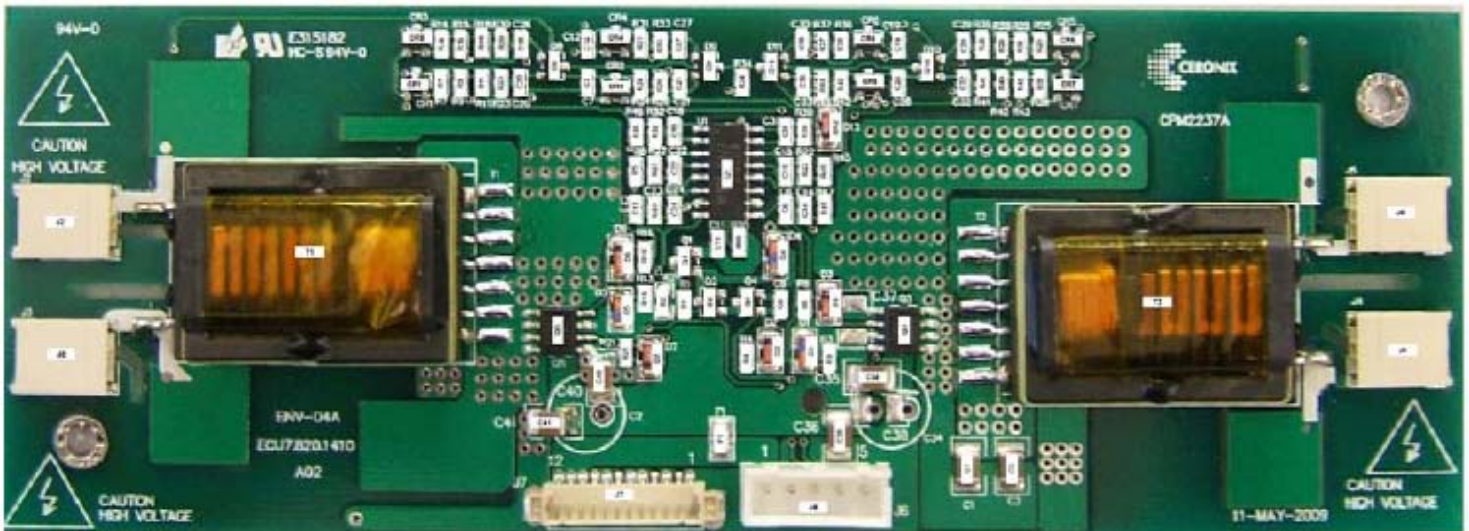




CERONIX

23. 12V 4-LAMP INVERTER CERONIX PART NUMBER CPM2237A

INPUT: 12VDC, 2.4A
OUTPUT: CCFL LAMP CURRENT RANGE 3.0-6.5mA @ 50kHz



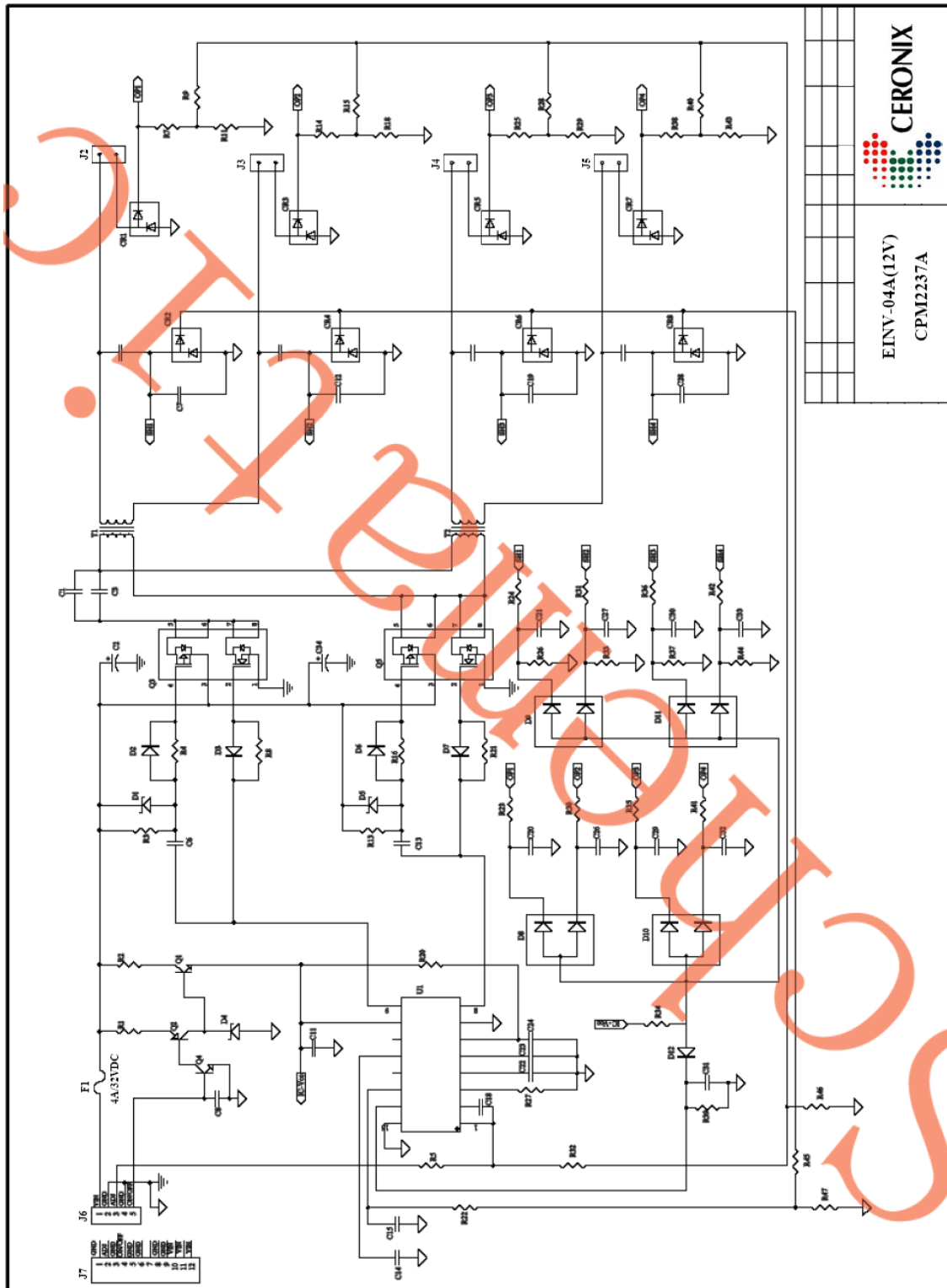
J6	DC SUPPLY AND CONTROL	J7
PIN	FUNCTION	PIN
1	+12VDC	10, 11, 12
2, 4	GROUND	1, 3, 5, 6, 8, 9
3	BRIGHT ADJUST	2
5	ON/OFF CONTROL	4
	NC	7

J2, J3, J4, J5 CCFL LAMP CONNECTION	
PIN	FUNCTION
1	CCFL HIGH VOLTAGE
2	CCFL RETURN



CERONIX

23. 12V 4-LAMP INVERTER SCHEMATIC CERONIX PART NUMBER CPM2237A



CERONIX
EINV-04A(12V)
CPM2237A